THE DISTRIBUTION AND INTER-RELATIONSHIPS OF *PERGA AFFINIS* KIRBY AND *PERGA DORSALIS* LEACH (HYMENOPTERA, SYMPHYTA).

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Synopsis.

New characters for the separation of the two closely related species of the sawflies, *Perga affinis* Kirby and *Perga dorsalis* Leach, are recognized. The distribution of each species is discussed, and on the basis of the newly recognized characters each species is divided into geographical subspecies.

In the past considerable difficulty has been experienced in the specific separation of the two sawflies *Perga affinis* Kirby and *Perga dorsalis* Leach. The types of both species are males, and authors in the past have experienced some difficulty in distinguishing between them. In the case of the females there has been less difficulty in distinguishing two forms, though the two were considered to be closely related. Characters are now recognized in the males which make separation of the two species very easy. As these characters are also present in the females there is now no difficulty in associating the sexes and correctly assigning specific names to the two species.

Perga affinis has an extensive range and can itself be separated into three subspecies. The typical form occurs from the southern coast of Victoria around Melbourne, through inland Victoria and New South Wales to at least as far north as Moreton Bay, Queensland. The typical subspecies occurs also in western Victoria and is known from the Adelaide region of South Australia. Throughout this range the legs, except the coxae, are all pale, though in most cases the middle and hind trochanters are somewhat darkened and the femora, especially the hind femur, though pale, are darker than the tibiae. The gaster has a greenish-black iridescence. One female from Hazlewood, Victoria, has the base, apex and caudal margin of the hind femur darkened but not black. In the other two females examined from this locality the hind femur is entirely pale. In the vicinity of Canberra, and possibly at all localities to the north of it, the mesepimeron is generally all black. In southern Victoria the mesepimeron usually has a large pale area. At localities around the New South Wales–Victorian border there is considerable variation in the colour of this structure. Some populations fall clearly into one or other of the above two categories, while other populations are quite variable. Insufficient material has been examined from South Australia to ascertain the position regarding the colour of this structure, but in all specimens examined there was a pale spot, sometimes small.

On Flinders Island and in Tasmania (south at least as far as Hobart) there is a pale subspecies in which the gaster has a distinct brownish hue and the coxae are paler than normal. There are also some small structural differences.

In the western part of the species range, in western Victoria (Horsham, Wilkur) and in South Australia (Sleaford Bay), there is a subspecies with comparatively dark legs, and the gaster has a bluish-black iridescence with less of the underlying brown colour.

It is difficult to account for the presence of the typical form of *affinis* in the region of Adelaide except as an introduction, for both to the west of Adelaide (at Sleaford Bay) and to the east (in western Victoria) there is a quite distinct subspecies common to these two areas.

Perga dorsalis is more of a coastal species. It, too, can be divided into subspecies. In the typical form the gaster has a green-black iridescence and the hind femur is dark

in part. This form occurs in coastal New South Wales, extends south into Victoria and possibly north into Queensland. It occurs inland as far as Canberra, but not commonly so.

In central southern Victoria (Ballarat) there is a pale subspecies in which the gaster is entirely brownish except for the basal segment, and the hind femur is all pale.

In western Victoria (Grampians and Little Desert) there is a third subspecies which does not differ in colouring from the typical form, but which has distinctive ornamentation of head and pronotum.

Key to Species and Subspecies.

Females.

Hairs of ovipositor valves very dense and fine, almost touching one another, tips of hairs not spooned; flattened "saw-bench" on lower margin of saw-sheath very long and thin, without obvious longitudinal striae.

i. Lower jena with only scattered fine hairs (punctures large and usually spaced); all coxae black at least in part.

(*a*) Legs (except coxae) all pale (middle and hind trochanters often partly darkened); abdomen green-black ..... *affinis affinis* Kirby.

1. Mesepimeron with a pale spot, spot rarely indistinct ..... Victorian form.
2. Mesepimeron black, rarely with a pale spot ..... Canberra form.

(*b*) Trochanters mostly dark; bases of middle and hind femora black except narrowly anteriorly, caudal margin and apex of hind femur dark; abdomen blue-black ..... *affinis atrata*, subsp. nov.

ii. Lower jena with dense short hairs; coxae with only very small brownish-black areas (legs, except coxae, all pale; mesepimeron with a large pale area; abdomen rather pale, with a brownish tinge) ..... *affinis insularis*, subsp. nov.

Hairs of ovipositor valves not dense, with a considerable space between each hair, tips of hairs spooned; flattened "saw-bench" on lower margin of saw-sheath relatively short and broad, with seven or eight obvious longitudinal striae (lower jena with dense short hairs; coxae black in part; mesepimeron with a pale spot).

i. Hind femur partly dark; abdomen with green-black iridescence.

(*a*) Vertex of head without a small glabrous area at meson above; pronotal lobe with the oblique sulcus ill-defined or absent; spooning of hairs on saw-sheath pronounced ..... *dorsalis dorsalis* Leach.

(*b*) Vertex of head with a small glabrous area at meson above; pronotal lobe with the oblique sulcus deep and clearly defined; spooning of hairs on saw-sheath limited to apices ..... *dorsalis nitida*, subsp. nov.

ii. Hind femur all pale; abdomen rather pale, entirely brownish except for basal segment, (vertex of head with a small glabrous area at meson above; pronotal lobe with the oblique sulcus ill-defined or absent; spooning of hairs on saw-sheath limited to apices) ..... *dorsalis castanea*, subsp. nov.

Males.

Lower jena with only scattered fine hairs (punctures large and usually spaced); first segment of abdomen generally obviously pale except at base; coxae generally mostly pale (dark in Canberra form) ..... *affinis*.

Lower jena with dense short hairs; first segment of abdomen generally only narrowly pale at apex or all dark; coxae generally mostly black ..... *dorsalis*.

Lower jena with dense short hairs; first segment of abdomen obviously pale except at base; coxae mostly pale ..... *affinis insularis*.

Perga dorsalis Leach.

Perga dorsalis Leach, 1817; Benson, 1939: 334.

Benson (1939) has given a key for the separation of this species from others of the genus so that only those characters used in the separation of this species from *affinis* are listed below.

Perga dorsalis dorsalis Leach.

Female. Coxae black in part; hind femur partly dark; trochanters pale; abdomen with green-black iridescence; mesepimeron with the punctate area pale in part. Hairs of ovipositor valves not dense, with a considerable space between each hair, tips of hairs incurved and spooned; flattened "saw-bench" on lower margin of saw-sheath relatively short and broad, with seven or eight obvious longitudinal striae; lower jena with dense short hairs.

Male. Similar to the female, but legs, except coxae, all pale; coxae mostly dark as in the female.

Type. Holotype ♂ in the British Museum (Natural History).

Type Locality. New South Wales.

Distribution. Coastal New South Wales, extending south into Victoria and north possibly into Queensland. The species extends inland to Canberra, but is not common there.

PERGA DORSALIS CASTANEA, subsp. nov.

Female. Similar to the typical form, but the abdomen rather pale, entirely brownish except for the basal segment; hind femur all pale. Spooning of hairs on saw-sheath not as pronounced as in the typical form; vertex of head with a small glabrous area at meson.

Male. Similar to typical form except for small glabrous area at meson of vertex.

Type. Holotype ♀, allotype ♂ and 1 ♂, 16 ♀ paratypes in the C.S.I.R.O. Division of Entomology Museum, Canberra; 2 ♀ paratypes in each of the National Museum of Victoria, Burns Collection and the British Museum (Natural History).

Type Locality. Ballarat, Victoria (Dec. 1958 and Jan. 1959, F. M. Leask).

Specimens from Belgrave, Victoria, tentatively referred to this subspecies, have the abdomen all brownish.

PERGA DORSALIS NITIDA, subsp. nov.

Female. Similar to the typical form in colouring; vertex of head with a small glabrous area at meson; pronotal lobe with the oblique sulcus deep and clearly defined; hairs of lower jena not as dense as in the typical form.

Male. Not known definitely.

Type. Holotype ♀ and 3 ♀ paratypes in the National Museum of Victoria; 1 ♀ paratype in C.S.I.R.O. Division of Entomology Museum, Canberra; 1 ♀ paratype in Burns Collection; 1 ♀ paratype in British Museum (Natural History).

Type Locality. Little Desert, Victoria (22 Jan. 1947 and 27 Mar. 1947, A. N. Burns).

There are also one female and one male from Blackburn, Victoria, in the Burns Collection, which are tentatively referred to this subspecies.

PERGA AFFINIS Kirby.

Perga affinis Kirby, 1882; Benson, 1939: 335.

Benson (1939) has given many of the characters of this species in his key to species.

PERGA AFFINIS AFFINIS Kirby.

Female. Legs, except coxae, all pale; all coxae black in part; mesepimeron with the punctate area often pale in part but sometimes all dark; abdomen with a green-black iridescence. Hairs of ovipositor valves very dense and fine, almost touching one another, tips of hairs not spooned but slightly bent inwards; flattened "saw-bench" on lower margin of saw-sheath very long and thin, without obvious longitudinal striae; lower jena with only scattered fine hairs, punctures large and usually spaced.

Male. Similar to the female, with only scattered hairs on the lower jena; coxae mostly pale, otherwise coloured as in the female. The coxae are mostly dark in the Canberra form.

Type. Holotype ♂ in the British Museum (Natural History).

Type Locality. Victoria.

Distribution. The species ranges from the central southern coast of Victoria north through inland New South Wales to southern Queensland and west to the Adelaide region in South Australia.

In specimens from southern Victoria there is occasionally some darkening of the hind femur.

The holotype of *intricans* Morice from Moreton Bay, Queensland, is placed in *affinis* by Benson (in litt., 1960). It could possibly represent a northern subspecies. The other two specimens in the type series of *intricans* from Adelaide, South Australia, belong in

dorsalis. This is the only record of *dorsalis* from South Australia, and some doubt is expressed as to the correctness of the locality.

PERGA AFFINIS INSULARIS, subsp. nov.

Female. Similar to the typical form, but abdomen with more brownish hues, though with a slight metallic iridescence; first tergite of the abdomen nearly all pale; coxae nearly all pale, with only small brownish-black areas, fore coxa virtually all pale, hind coxa with a narrow dark line laterally, area somewhat expanded at base; mesepimeron with a large pale area usually covering the punctate zone. Structurally differing only in having dense short hairs on the lower jena and with the punctures there confluent.

Type. Holotype ♀ and 4 ♀ paratypes in the National Museum of Victoria; 1 ♀ paratype in each of C.S.I.R.O. Division of Entomology Museum, Canberra, and British Museum (Natural History).

Type Locality. Flinders Island, Tasmania (28 Feb. 1946, B. A. Fisher).

Distribution. The subspecies is known also from Tasmania. 2 ♀♀, Hobart, 18 Mar. 1916, C. Cole, in the Australian Museum; 1 ♀, Hobart, 26 Mar. 1958, L. W. Miller, and 8 ♀♀, 3 ♂♂, Ouse, 8 Feb. 1956, W. J. Newport, in the collection of the Tasmanian Department of Agriculture (2 ♀♀, 1 ♂ retained in the C.S.I.R.O. Division of Entomology Museum, Canberra).

This subspecies of *affinis* approaches *dorsalis* in the density of the hairs on the lower jena, but in the characters of the genitalia it is allied to typical *affinis*.

PERGA AFFINIS ATRATA, subsp. nov.

Female. Similar to the typical form except in colouring; trochanters mostly dark, at least bases of middle and hind femora dark, hind femur often mostly dark.

Type. Holotype ♀ in the C.S.I.R.O. Division of Entomology Museum, Canberra; 2 ♀ paratypes (from Horsham) in the Burns Collection; 1 ♀ paratype (Wilkur) in the National Museum of Victoria.

Type Locality. Sleaford Bay, South Australia (31 Mar. 1959, J. Casanova). Paratypes from Wilkur, Victoria (Apr. 1956, Spurrell), and Horsham, Victoria (18 Mar. 1932, A. N. Burns).

This is a very dark form of *affinis*.

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